(d) combining results of the first and second algorithms to determine at least one combined combustion parameter.

2. The method of claim 1, wherein:

the step (b) includes a step of determining at least one first combustion parameter based upon the AC component of the monitored radiation;

the step (c) includes a step of determining at least one second combustion parameter based upon the AC component of the monitored radiation; and

the step (d) includes a step of combining the first and second combustion parameters to determine the at least one combined combustion parameter.

3. The method of claim 2, wherein the step (d) includes a step of multiplying the first and second combustion parameters to determine the at least one combined combustion parameter.

4. The method of claim 2, wherein:

the step (b) includes a step of analyzing at least one characteristic of a time-domain signal produced in response to the monitored radiation; and

the step (c) includes a step of analyzing at least one characteristic of a function generated in response to a frequency-domain representation of the monitored radiation.

5. The method of claim 2, further comprising the step of:

(e) correlating the at least one combined combustion parameter with at least one combustion variable.

6. The method of claim 1, further comprising the step of:

(e) correlating the at least one combined combustion parameter with at least one combustion variable.

7. The method of claim 6, wherein the step (e) includes a step of correlating the at least one combined combustion parameter with an amount of unburned carbon in fly ash.

8. The method of claim 6, wherein the step (e) includes a step of correlating the at least one combined combustion parameter with an amount of Nitrogen Oxides (NOx).

9. A method for analyzing operation of a combustor comprising steps of:

(a) using a first radiation sensor, that is sensitive to a first portion of an electromagnetic spectrum, to monitor an AC component of radiation emitted within the combustor;

(b) using a second radiation sensor, that is sensitive to a second portion of the electromagnetic spectrum which is different from the first portion, to monitor an AC component of radiation emitted within the combustor; and

(c) analyzing outputs of each of the first and second radiation sensors to determine at least one combined combustion parameter.

10. The method of claim 9, wherein:

the step (c) includes steps of:

(c1) analyzing the output of the first radiation sensor to determine at least one first combustion parameter;

(c2) analyzing the output of the second radiation sensor to determine at least one second combustion parameter; and

(c3) combining the first and second combustion parameters to determine the at least one combined combustion parameter.

11. The method of claim 10, wherein the step (c3) includes a step of multiplying the first and second combustion parameters to determine the at least one combined combustion parameter.

12. The method of claim 9, further comprising a step of:

(d) correlating the at least one combustion parameter with at least one combustion variable.

13. The method of claim 12, wherein the step (d) includes a step of correlating the at least one combustion parameter with an amount of unburned carbon in fly ash.

14. The method of claim 13, wherein the step (d) includes a step of correlating the at least one combustion parameter with an amount of Nitrogen Oxides (NOx).

15. A system for analyzing operation of a combustor comprising:

at least one radiation sensor arranged to monitor radiation emitted from flue gas in a post-flame zone of the combustor and to produce a signal indicative thereof; and

at least one processor that determines at least one combustion parameter based upon an AC component of the signal.

16. The system of claim 15, wherein the at least one processor is configured to process the signal to generate a function having a shape that changes in response to changes in the AC component of the signal, and to analyze at least one characteristic of the function to determine the at least one combustion parameter.

17. The system of claim 16, wherein the at least one processor is further configured to convert the signal into a frequency-domain amplitude spectrum, and to determine the at least one combustion parameter based upon at least one characteristic of the frequency-domain amplitude spectrum.

18. The system of claim 17, wherein the at least one processor is configured to analyze at least one characteristic of the signal in the time domain.

19. The system of claim 15, wherein the at least one processor is configured to analyze at least one characteristic of the signal in the time domain.

20. A system for analyzing operation of a combustor comprising:

at least one radiation sensor to monitor radiation emitted within the combustor and to produce a signal indicative thereof; and

at least one processor that analyzes an AC component of the signal according to a first algorithm, that analyzes the AC component of the signal according to a second algorithm, and that combines results of the first and second algorithms to determine at least one combined combustion parameter.

A2 21. (Amended) The system of claim 20, wherein the at least one processor is configured to determine at least one first combustion parameter based upon the AC component of the signal, to determine at least one second combustion parameter based upon the AC component of the signal, and to combine the first and second combustion parameters to determine the at least one combined combustion parameter.

22. The system of claim 21, wherein the at least one processor is further configured to determine at least one characteristic of the signal in the time-domain, and to determine at least one characteristic of a function generated in response to a frequency-domain representation of the signal.

23. The system of claim 20, wherein the at least one radiation sensor is arranged to monitor radiation emitted from flue gas in a post-flame zone of the combustor.

24. The system of claim 20, wherein the at least one radiation sensor is arranged to monitor radiation emitted from a flame zone of the combustor.

25. A system for analyzing operation of a combustor comprising:

at least one radiation sensor to monitor radiation emitted within the combustor and to produce a signal indicative thereof; and

at least one processor that determines an average amplitude of the signal during a particular time period; that counts at least one of a number of high peaks in the signal that, during the particular time period, achieve an amplitude, relative to the average amplitude, that is greater than a first threshold, and a number of low peaks in the signal that, during the particular time period, achieve an amplitude, relative to the average amplitude, that is less than a second

threshold; and that determines at least one combustion parameter based upon the counted number of high peaks and the counted number of low peaks.

26. The system of claim 25, wherein the at least one radiation sensor is arranged to monitor radiation emitted from flue gas in a post-flame zone of the combustor.

27. The system of claim 25, wherein the at least one radiation sensor is arranged to monitor radiation emitted from a flame zone of the combustor.

28. A system for monitoring of an amount of unburned carbon in fly ash generated by a combustor comprising:

at least one radiation sensor to monitor radiation emitted within the combustor and to produce a signal indicative thereof; and

at least one processor that analyzes the signal to monitor the amount of unburned carbon in fly ash generated by the combustor.

29. The system of claim 28, wherein the at least one radiation sensor is arranged to monitor radiation emitted from flue gas in a post-flame zone of the combustor.

30. Canceled.

31. A system for analyzing operation of a combustor comprising:

at least one first radiation sensor, that is sensitive to a first portion of an electromagnetic spectrum, to monitor an AC component of radiation emitted within the combustor;

at least one second radiation sensor, that is sensitive to a second portion of the electromagnetic spectrum which is different from the first portion, to monitor the AC component of radiation emitted within the combustor; and

at least one processor that determines at least one combined combustion parameter based upon outputs of each of the first and second radiation sensors.

32. The system of claim 31, wherein the at least one radiation sensor is arranged to monitor radiation emitted from flue gas in a post-flame zone of the combustor.

33. The system of claim 31, wherein the at least one radiation sensor is arranged to monitor radiation emitted from a flame zone of the combustor.

34. The system of claim 31, wherein the at least one processor is configured to determine at least one first combustion parameter based upon the output of the at least one first radiation sensor, to determine at least one second combustion parameter based upon the output of the at least one second radiation sensor, and to combine the first and second combustion parameters to determine the at least one combined combustion parameter.

35. An apparatus for supporting a sensor near an outer surface of a combustor such that the sensor may sense combustion activity inside the combustor, comprising:

a casing, forming a first channel through which gaseous matter may pass; and

a member, forming a second channel, adapted to have a radiation sensor mounted thereto;

wherein, when the apparatus is mounted on the combustor and the radiation sensor is mounted to the member, the second channel defines an unobstructed linear path that extends between the radiation sensor and a position inside the combustor, the unobstructed linear path intersecting at least a portion of the first channel.

36. The apparatus as claimed in claim 35, wherein:

the first channel has a first cross-sectional area; and

the second channel has a second cross-sectional area that is smaller than the first cross-sectional area.

37. The apparatus as claimed in claim 35, further comprising at least one divider interposed between first and second surfaces of the casing to divide the first channel into a plurality of ducts, the unobstructed linear path intersecting at least a portion of each of the plurality of ducts.